STANFORD RESEARCH INSTITUTE
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TECHNICAL MEMORANDUM

A Progress Report on Contract Number 1471(S)73

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I FIELD MEASUREMENTS PROGRAM, TASKS 1, 2, AND 3

A. Introduction

Following is a summary of work carried out under Field Measurements Contract No. 1471(S)73, Tasks 1, 2, and 3. Tasks 1 and 2 cover a two-week field measurement program (14-28 August 1972) with consultant Ingo Swann; Task 3 covers a nine-day field measurement program within the time period 1 December 1972 to 15 January 1973 with consultant Uri Geller.

B. Background

A program in biofield measurements was initiated in July 1972 with a preliminary experiment with Mr. Swann. In this work using a shielded magnetometer, Mr. Swann apparently demonstrated an ability to increase and decrease at will the magnetic field within a superconducting magnetic shield. This experiment made use of an existing facility and we have confidence that Mr. Swann had no prior knowledge of either the apparatus or of our intended experiment. The experimental results were carefully scrutinized and were unlike any data previously produced with this apparatus. That observation is summarized in Proposal for Research SRI No. ISU 72-134 (Biofield Measurements Program) in your possession. Based on that observation, Tasks 1 and 2 were initiated to carry out further experimentation with Mr. Swann in the field measurements area, and, later, Task 3 was added to carry out similar experimentation with Mr. Geller.

C. Protocol

A rigid protocol for experimentation in the area of psychoenergetic research has been instituted in order to carry out the assigned tasks.

1. Because of the history of charlatanism in this area, one of our basic operating assumptions has to be that we cannot exclude the possibility that a subject will hoax if given an opportunity. To handle this, we consider it important to design experiments a) which are totally under the design and control of the experimenter rather than the subject, and b) which are considered in their basic design to be cheatproof. Specifically, if in the performance of an experiment or in the evaluation afterwards it is found that the results could in principle be duplicated by cheating or stage magic, then that experiment is to be considered void, even when there is no evidence of cheating.

2. Given the nature of the phenomena, any prejudgment or bias on the part of the experimenter, whether "pro" or "con", is more likely to affect the experimentation, results, and their evaluation in this area than in any other area of behavioral research. Therefore, we consider it important to design experiments which a) can be carried out using double blind procedures and b) can be evaluated by objective measures independent of experimenter belief structures.

II TASKS 1 AND 2; EXPERIMENTATION WITH INGO SWANN

The magnetometer observation of July 1972 indicated at least two forms of biofield functioning: 1) the passive perception of information through some as yet unidentified communication channel, and 2) the active perturbation of the functioning of a laboratory device. The initial experiments were designed to test each of these functions separately.

A. Probability 1/3 Target Location

The first experiment to be carried out under Tasks 1 and 2 had as its goal the testing of the hypothesis that information can be obtained from locations inaccessible to ordinary viewing.

In order to place the experiment on a quantitative basis, a procedure was followed in which a target object was placed in one of three identical containers, the task of Swann being to enter the experimental area after placement and indicate the target container. Targets consisted of a range of organic and inorganic materials (e.g., quartz prism, tomato, flower, etc.). In this short term study insufficient data exists for discrimination among materials as to their efficiency as target material. The target containers were 9-1/8" x 4-5/8" x 4-9/16" x 1/4" thick wooden boxes, and the choice of target container for each trial was determined by a random number generator.

The experiment was not carried out in a double blind fashion in this particular case (i.e., the experimenter in the room knew of the target location). However, in order to minimize subliminal cueing, the experimenter was seated behind the subject in such a

position that he could not observe the choosing process on the part of the subject until after the choice was made. In a follow-on program subsequent successful double blind experiments with this subject further indicate that the experimenter is not part of the choice process.

The results are shown in Figures 1 and 2. The experiment was repeated ten times per day over a five-day period yielding a total run of fifty trials. With an a priori probability of $p = 1/3$ per trial, the expected number of hits in a 50-trial run is given by $\bar{y} = 16.6$. The observed number of hits was 26, exceeding chance expectation by $\approx 3\sigma^*$; the a priori probability of such a result due to chance alone is $p = 0.005$.

As indicated in Figure 2, an additional item of significance is the general increase in the number of hits/10-trial run over the 50-trial period. A least-squares fit linear regression curve (learning curve) indicates a learning rate of 0.5/10-trial run. The a priori probability of obtaining the above learning curve by chance for the given data is $p \approx 0.1$ (obtained from an analysis of the slope using small sample Student's t distribution statistics). Therefore, the indication for learning is weaker than the indication of ability, but nevertheless positive.

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*Standard deviation $\sigma = \sqrt{npq}$, where n is the number of trials, p is the a priori probability of a correct choice, and q is the a priori probability per trial of an incorrect choice.

The conclusion to be drawn from this experiment is that there is a strong indication that information was being transferred from one location to another through some as yet unidentified communication channel.

B. Remote Temperature Control Experiment

A second experiment was initiated to examine the active perturbation of the functioning of a laboratory device. The target chosen was a copper-constantin 30 $\mu V/^{\circ}F$ thermocouple sealed in a 50 milliliter flask of helium gas at atmospheric pressure. (Helium was chosen at the request of Mr. Swann who described an affinity for helium following the original magnetometer experiment which involved cooling by liquid helium.)

Mr. Swann's task was to learn to control the temperature registered at the thermocouple junction as it was being monitored by a Hewlett-Packard Model 425A DC microvoltmeter and displayed on a strip chart recorder. The use of feedback in an experiment of this nature is considered important both by Mr. Swann and by the experimenters.

Following a learning period of several days' effort, an hour or so a day, Mr. Swann expressed confidence in his ability to perform the task. A rigid protocol was then followed in which the experimenter and Mr. Swann sat in fixed positions in the laboratory, Mr. Swann two feet from the target, experimenter four feet behind Mr. Swann.

The data, shown in Figure 3, were obtained in the following procedure. After a 20-minute control period in which the temperature was stabilized, a predetermined random series of ten "heat" and "rest" commands were read out by the experimenter at 3-minute intervals. The recorded data indicates that nine of the ten commands resulted in changes in agreement with the commands. Control runs with other laboratory personnel under identical conditions yielded null results. Therefore it can be concluded that the control of temperature variations in a remote object is indicated. Further work in this area is necessary to determine from temperature distributions, shielding effects, etc., whether such control is due to an exquisite ability to control known physical effects or due to the activation of some paranormal mechanism.

C. 4-State Random Generator Experiment

A third experiment with Mr. Swann involved the use of an electronic random number generator which randomly chooses one of four possible targets (p = 1/4) without indicating its choice until Mr. Swann had indicated to the machine his choice by pressing a button.

The apparatus used in this work was designed with the goal of enhancing extraordinary human functioning which may be a more or less latent capacity to some extent in all people. Our hypothesis is that enhancement can be accomplished by allowing the user of the machine to become consciously aware of his own mental state at those times when he is most successfully employing his extra sensory faculties. With increased conscious awareness of this mental state, we hypothesize that he is then able to bring his otherwise intermittent faculties under his volitional control.

An important feature of the machine is that the choice per se of a target is not forced. That is, the subject may press a PASS button on the machine when he wishes not to guess. Thus, with practice, the subject can learn to recognize those states of mind in which he can correctly choose the target. He does not have to guess at targets when he does not feel that he "knows" which to choose.

When the PASS button is pushed, the machine indicates what its choice was, and neither a hit nor a trial is scored by the machine which then goes on to make its next selection. We consider this elimination of forced choice to be a significant condition for learning to enhance extraordinary perception abilities.

When the user of the machine indicates his choice to the machine, he is immediately and automatically informed of the correct answer. Until that time both experimenter and the subject remain

ignorant of the machine's state until the subject has made his choice; thus, the experiment is of the double-blind type.

Because the user obtains immediate information feedback as to the correct answer, he may be able to recognize his mental state at those times when he has made a correct response. If the information feedback to the user were not immediate, we hypothesize as much learning would not take place and less or no enhancement would be achieved.

The machine operated in a mode in which a run of trials continued until 20 misses were accumulated. At that point the run was terminated and the number of hits/run (excess trials over 20) were recorded. Data with this machine were obtained on seven separate occasions, resulting in the plot of Figure 4. Total scoring was at the $p = 0.35$ level and therefore did not differ from chance significantly (due perhaps to Mr. Swann's expressed distaste for working with machines). However, the general increase in the number of hits/run over the seven-run period indicated a learning trend as in the target location experiment of Section A. A least-squares fit linear regression curve (learning curve) indicates a learning rate of 0.7/run ($p \approx 0.07$ significance level).

D. Additional Areas Indicating Further Investigation

Of further significance, but difficult to evaluate quantitatively at this point, was a number of subjective observations reported by Mr. Swann during the course of experimentation. Mr. Swann is extremely articulate about subjective impressions, visualizations, etc., which leads to the possibility of building up a coherent picture over a long period of experimentation which can then be tested objectively. Examples include his inner perception of helium gas as yellow (perhaps related to the known resonance in the yellow portion of the spectrum), his use of visualizations of scanning beams in perception experiments, his reported subjective impression of scanning beam diffraction into a rainbow when a quartz prism was the target, observations that extra-normal vision is weakest in the visible portion of the spectrum where dependence on ordinary human vision predominates, etc. If such observations can be brought into a pattern and correlated with objective measurements, significant insight into extraordinary human functioning could be expected.

III TASK 3; EXPERIMENTATION WITH URI GELLER

The experiments conducted with Geller in November-December, 1972, fell into two broad categories:

1. Perception experiments in which he was asked to identify and draw the contents of opaque sealed envelopes, to identify a die face concealed in a metal box, and to find objects hidden in one of ten identical film cans.

2. Experiments involving physical effects in which he was asked to interact with laboratory equipment by perturbing the experimental apparatus without physical contact.

All experiments were monitored by simultaneous filming, videotaping, sound recording, and, where appropriate, laboratory instrumentation. The experiments performed with Mr. Geller are summarized below in writing and a film covering the experimentation is in progress.

A. Probability 1/6 Double-Blind Dice Box Experiment

A double-blind experiment was performed in which a single die was placed in a closed metal box. The box was vigorously shaken by one of the experimenters and placed on a table. The orientation of the die inside the box was unknown to the experimenters at that time. Mr. Geller would then look at the box without touching it and call out which die face he believed was uppermost. He gave the correct answer each of 8 times the experiment was performed. The probability that this could have occurred by chance alone is approximately one in a million. The experiment was actually performed ten times, but on two occasions the subject said his perception was not clear and he was allowed to pass.

B. Probability 1/10 Hidden Object Experiment

For this experiment ten identical aluminum film cans with stainless steel tops were placed in a row. An outside assistant not associated with the research would place the cans in a random position and put the target object into one of them. He would then put caps on all the cans and leave the experimental area, notifying the experimenters that the experiment was ready. The experimenters, who were not aware which can contained the object, would then enter the room with Geller (i.e., the experiment was carried out in a double-blind fashion). The subject would either pass his hand over the row of cans or simply look at them. He would then call out the cans he felt confident were empty, and the experimenter would remove them from the row. When only two or three cans remained, Geller would announce which one he thought contained the target object. He had no difficulty identifying the location of water, steel ball bearings and small magnets. This task was performed twelve times, without error. The probability that this could have occurred by chance alone is about one in a trillion. On two occasions he declined to answer. One of the targets that apparently "stumped" him was a paper-wrapped metal ball bearing. The other was a sugar cube.

C. Picture Drawing Experiment

In this experiment simple pictures were drawn on 3x5 file cards. The field of possibilities of target materials was at no time revealed to Mr. Geller. The pictures were put into double-sealed envelopes by an outside assistant not associated with the experiment

and placed in a safe for which the experimenters did not have the combination. To conduct the experiment, the experimenters, two of which had to be present, were permitted to select an envelope at random from the safe, open it to identify the picture, seal it again and enter the experimental room. Geller made seven almost exact reproductions of the seven chosen target pictures, with no errors (see Fig. 5). Video and audio monitoring did not reveal any cueing possibilities. Figure 6 shows the results obtained when a drawing was brought in as a test by an outside consultant to a potential sponsor. The inspiration of the drawing was a magazine cartoon shown in the upper right. The drawing itself is shown in the upper left, and Geller's version is shown in the lower right. A double blind version of the drawing experiment is shown in Fig. 7 where an envelope chosen at random and unknown both to experimenter and Geller resulted in the reproduction shown.

Two experiments to measure physical perturbation of laboratory apparatus were also carried out. One of these involved apparently exerting a force on a laboratory balance, and the other was the generation of an apparent magnetic field recorded by a magnetometer. Both of these experiments were performed several times with results improving with repetition, showing apparent evidence of learning taking place.

D. Laboratory Balance

A precision laboratory balance measuring weights from one milligram to fifty grams was placed under a bell jar. This balance, made by Scientech Corp., Boulder, Colorado, generated an electrical output voltage in proportion to the force applied to it. The balance had a one-gram mass placed on its pan before it was covered with a bell jar. A chart recorder then continuously monitored the force applied to the pan of the balance. On several occasions the subject caused the balance to respond as though a force were applied to the pan. This was evidenced by a corresponding displacement shown by the chart recorder. These displacements increased from 50 - 1500 milligrams and were significantly different in signature from those that could be produced by striking the bell jar or the table or jumping on the floor, as indicated in Fig. 8. Efforts on our part to debunk the experiment by the use of magnets or discharge of static electricity against parts of the apparatus were unsuccessful. Also, day-long control runs with no effort on Geller's part failed to reveal noise or artifacts resembling the signals produced by Geller's efforts. Therefore, the experiment indicated an apparent ability of Geller to affect the apparatus by an as yet unidentified means.

E. Magnetometer Experiment

A Bell gaussmeter was used to determine if Mr. Geller could perturb an instrument sensitive to magnetic fields. The instrument was set to a full scale sensitivity of 0.3 gauss. The subject would move his empty hands near the instrument in an effort to cause a deflection of the chart recorder monitoring the magnetometer output. In carefully filmed experiments, Geller was able to perturb the magnetometer causing full scale deflection without touching the measuring head of the instrument. Geller was examined before, during, and after experimentation with the same magnetometer probe to insure against the presence of artifact-producing materials.

F. Further Observations

A number of other observations were made which for one reason or another did not meet our rigorous protocol prerequisites for a controlled experiment and therefore are not to be included in the category of experiments A through E which we consider well controlled.

Perhaps the most notable of these were a class of observations associated with one of Geller's alleged attributes that had been reported to us, which was that he was able to bend or break metal from a distance without touching it. In the laboratory we did not find him able to do so. It was always necessary for him in the experimental situation to have physical contact with any metal he bent. In a more relaxed protocol where he was permitted to touch the metal, metals were bent. This included SRI-manufactured and

serialized rings of brass and copper which were measured to require 150 lbs. force to bend them. However, it was not clear whether such bending took place because Mr. Geller has extraordinarily strong fingers and good control of micro-manipulatory movements, or whether the metal "turns to plastic" in his hand as he claims. Our final conclusion in watching our films was that simple photo interpretation is insufficient to determine whether metals are being bent by normal or paranormal means.

In summary, the three perception experiments (hidden drawings in envelopes, double-blind hidden object experiment, double-blind die-in-the-box experiment) and the two psychokinetic experiments (depression or raising of a weight on an electrical scale and the magnetometer indication) do not admit of any ready counterhypothesis to the concept of extraordinary human functioning.

IV SUMMARY AND CONCLUSIONS

The data gathered to date with the aid of consultants Swann and Geller point to the existence of an as yet unidentified mode of extraordinary human functioning. Efforts to explain the phenomena either within the framework of conventional concepts or by exposure of outright fraud have both met with failure at this point. With regard to the latter possibility, it might be mentioned that our efforts to detect fraud were quite sophisticated (including the use of consultant magicians on our part) under the hypothesis that subjects skilled in trickery might be sent to us to test the adequacy of our program to detect fraud.

The observations to date are sufficiently detailed and well controlled to indicate without doubt that extraordinary human functioning has been observed. Further work is required, however, to obtain sufficient data to permit the emergence of patterns of cause-effect relationships and the elucidation of the mechanisms and agencies involved.

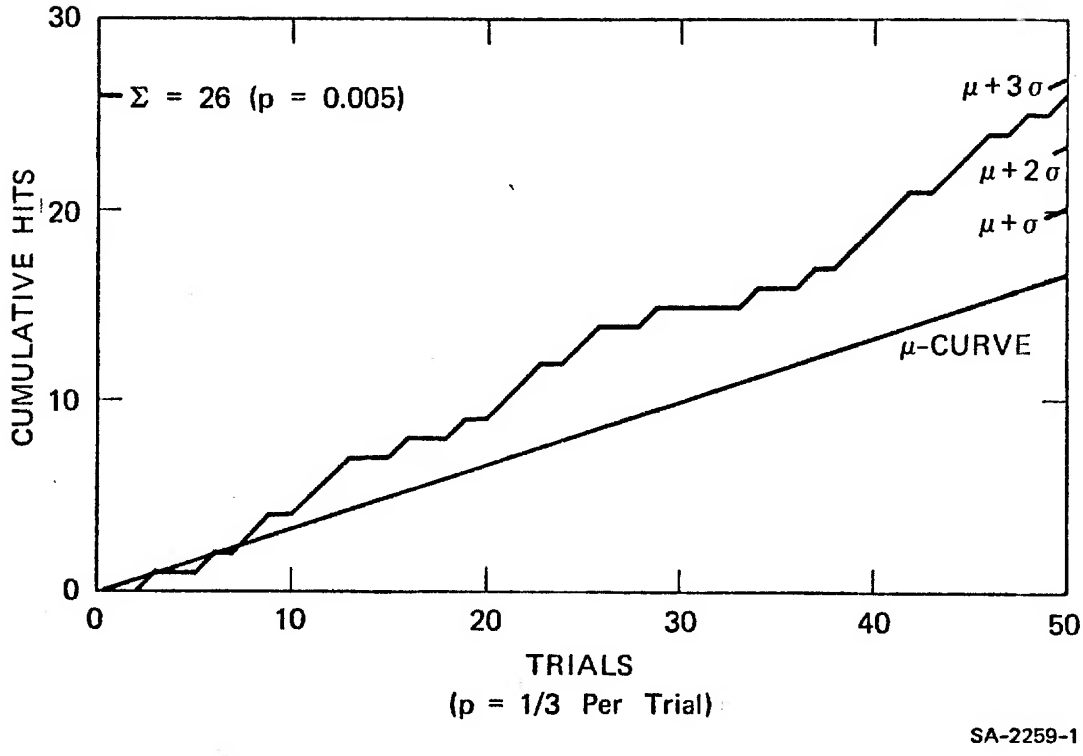


FIGURE 1

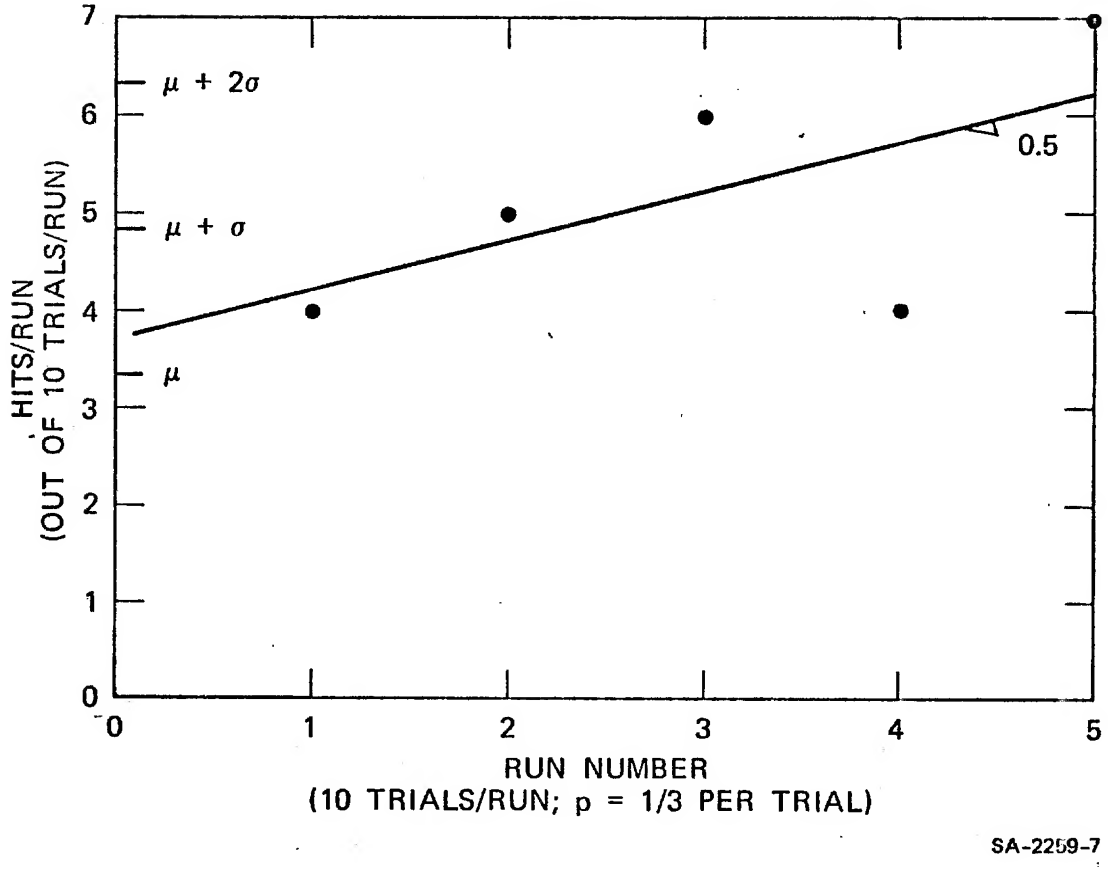


FIGURE 2

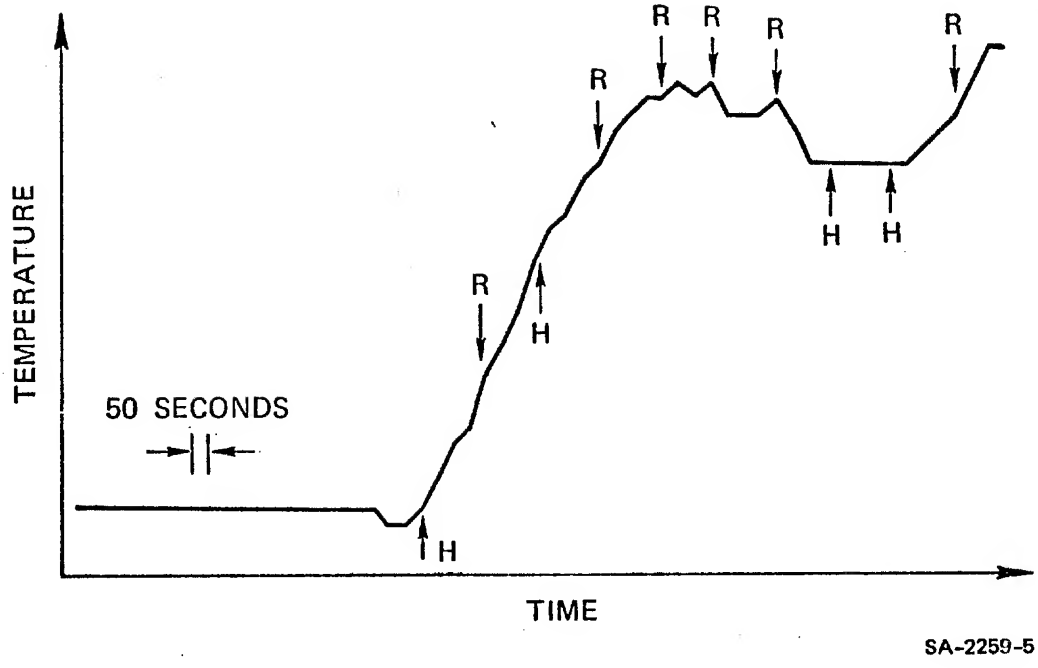


FIGURE 3

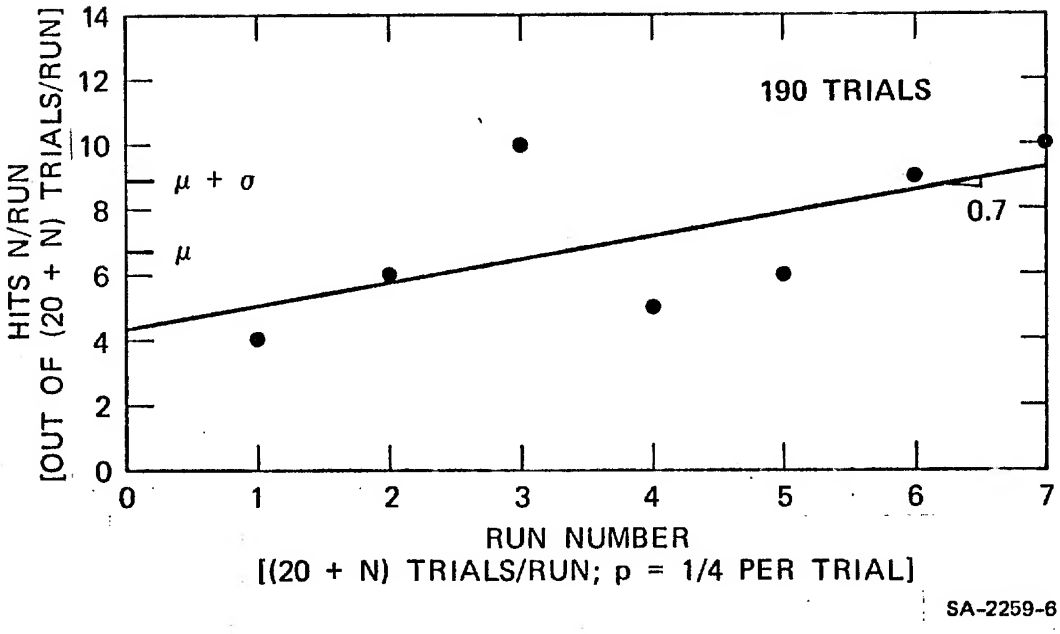
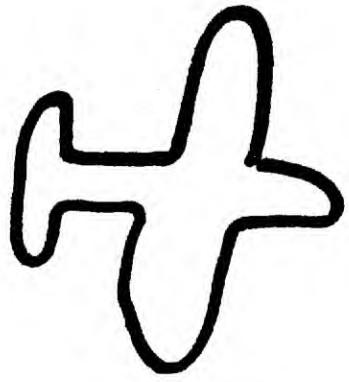


FIGURE 4

12/7/72 DRAWING IN ENVELOPE
PROTOCOL: DRAWINGS MADE IN A.M. BY TARG - SEALED IN ENVELOPE



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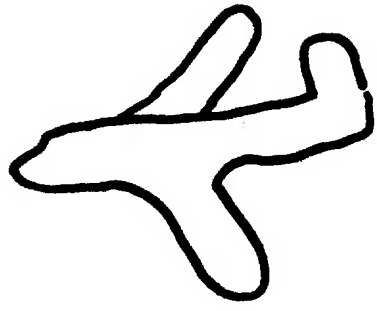

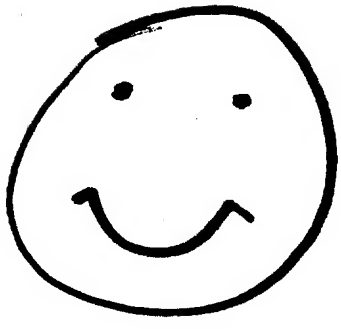

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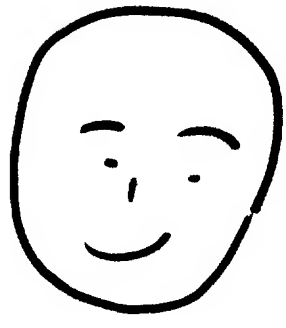

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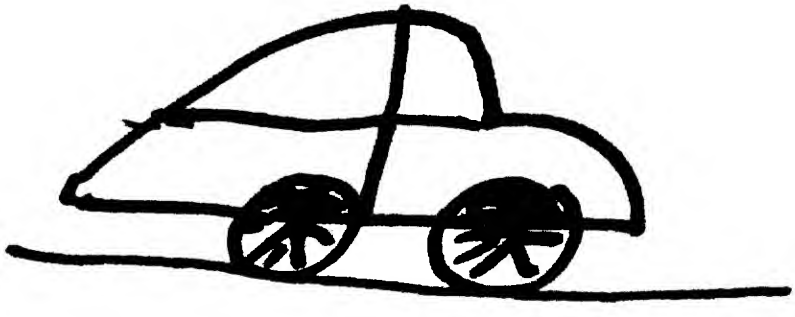

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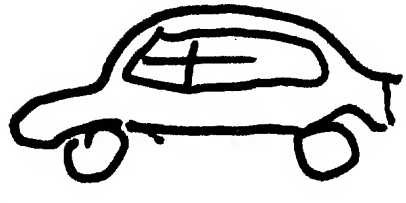

FIGURE 5

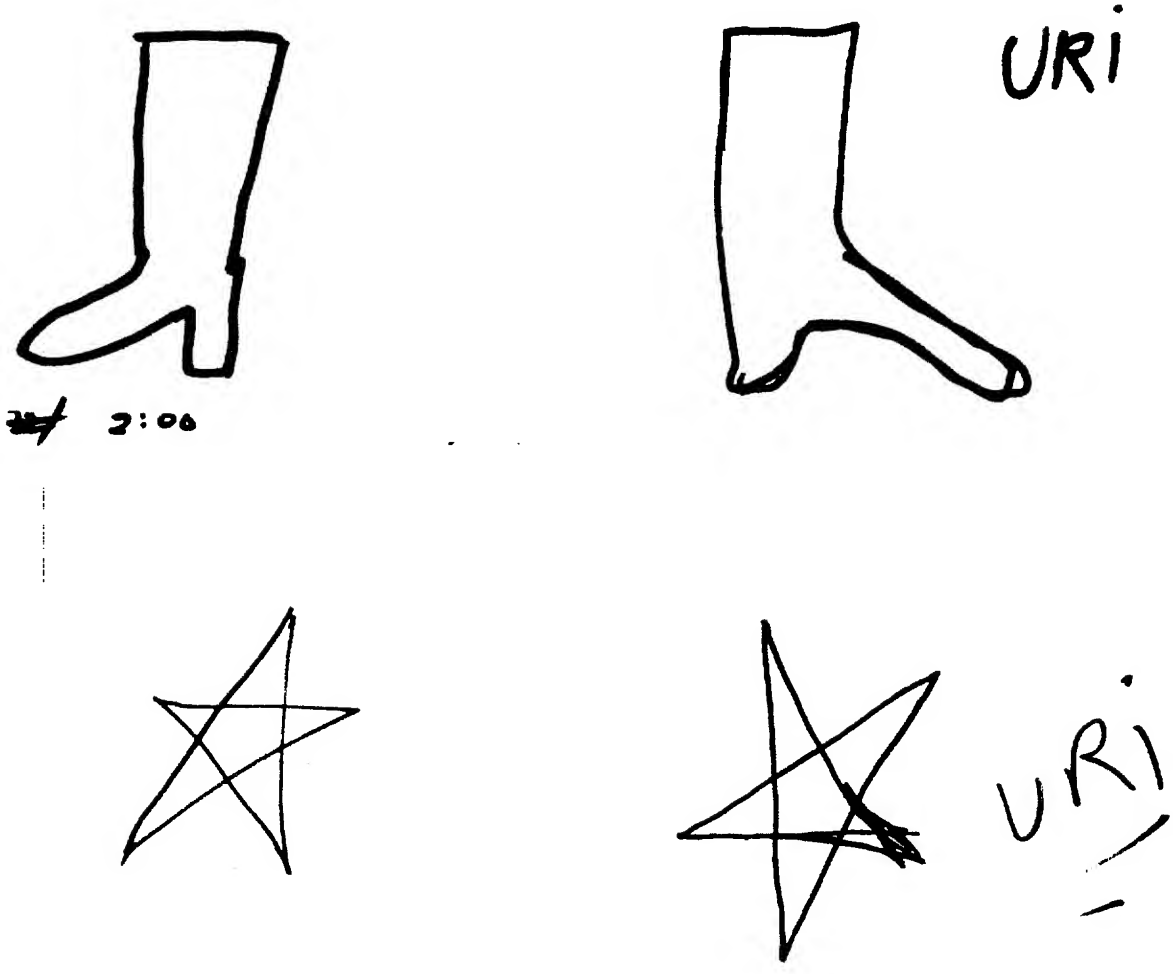

FIGURE 5 (Continued)

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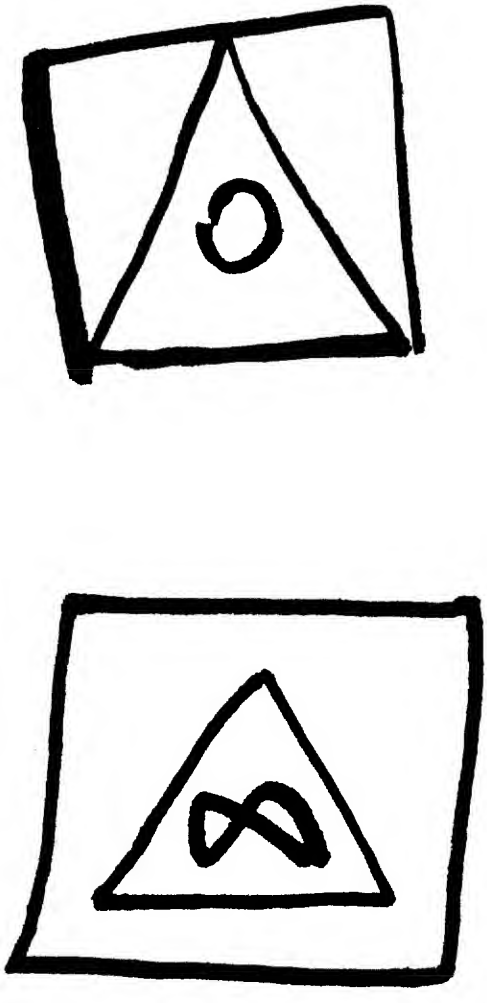

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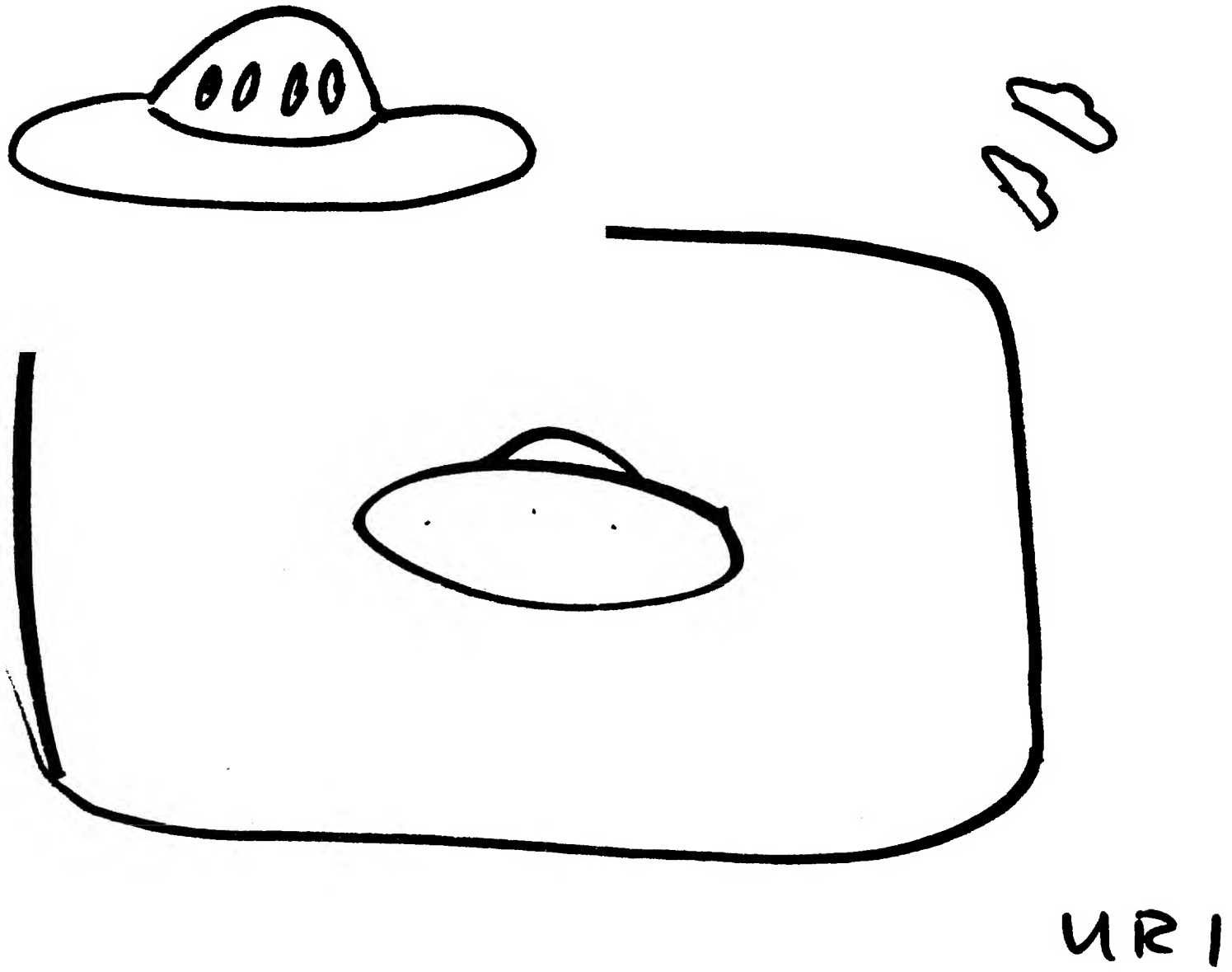


FIGURE 5 (Concluded)

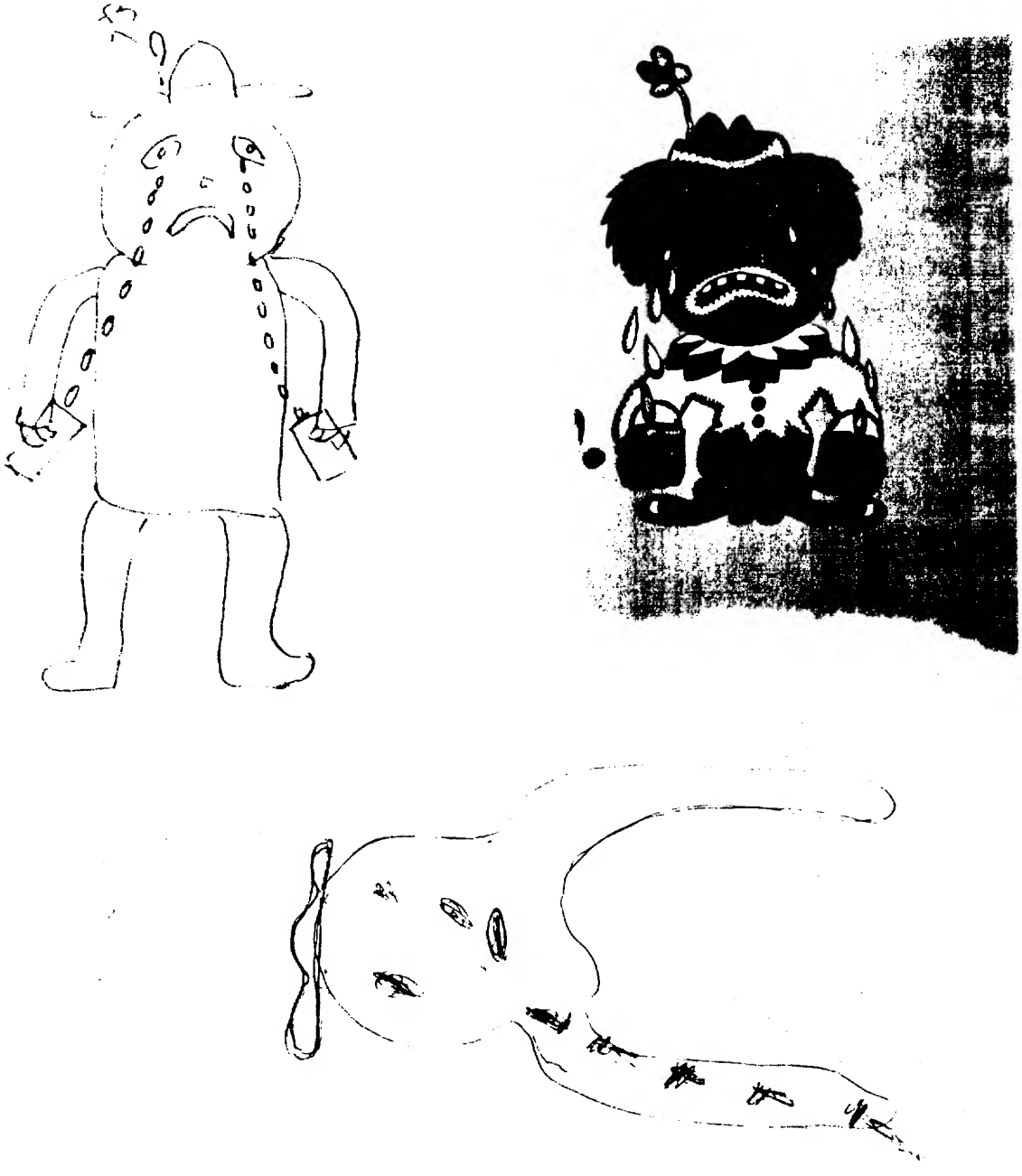
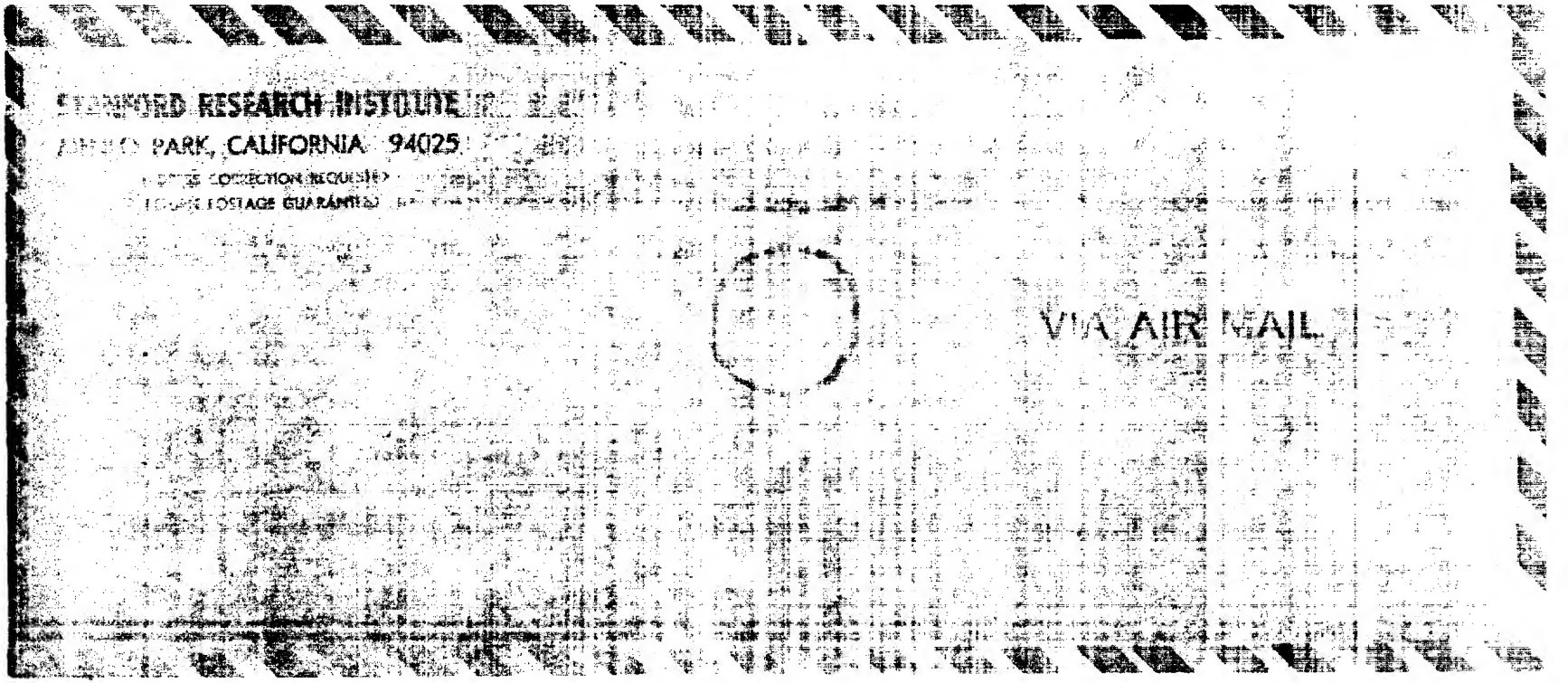


FIGURE 6



FIGURE

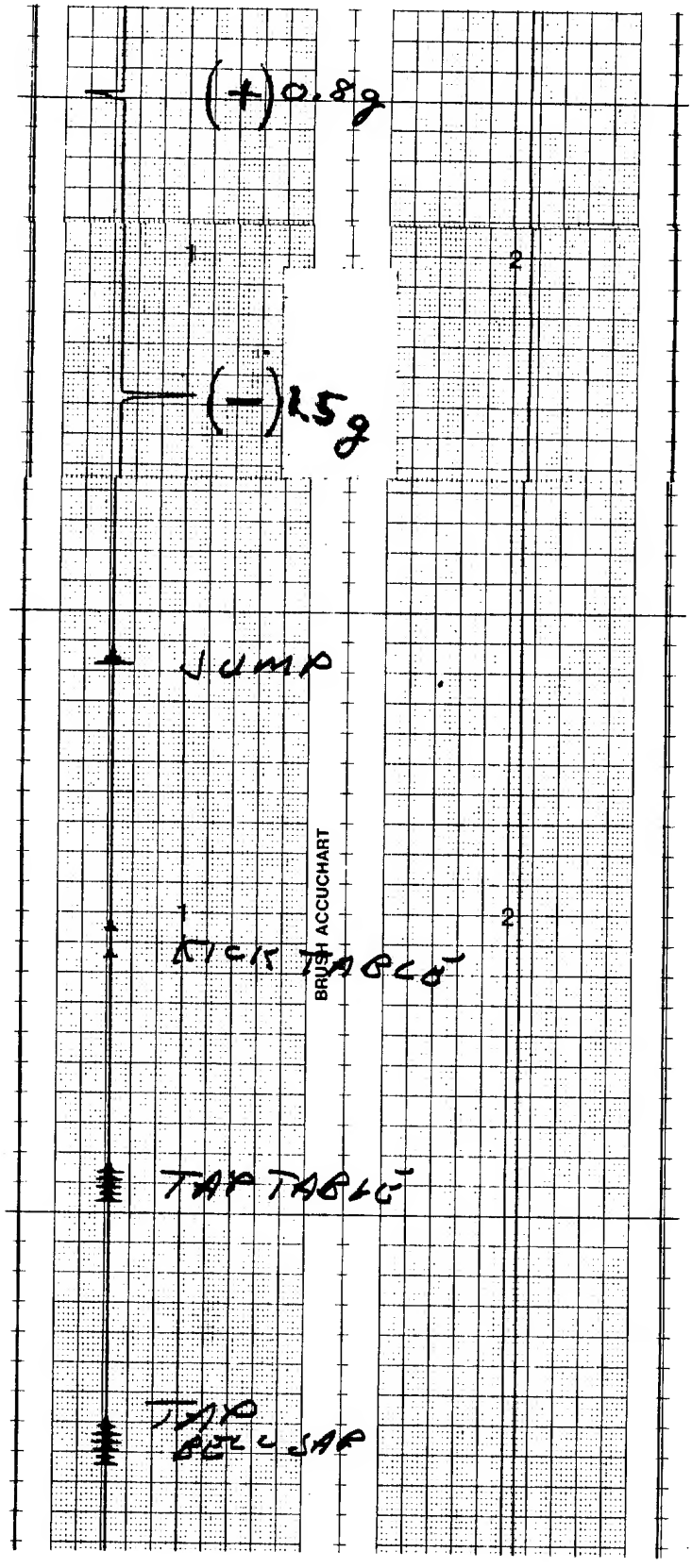


FIGURE 8